CREMSON

Map Driver Operation Manual

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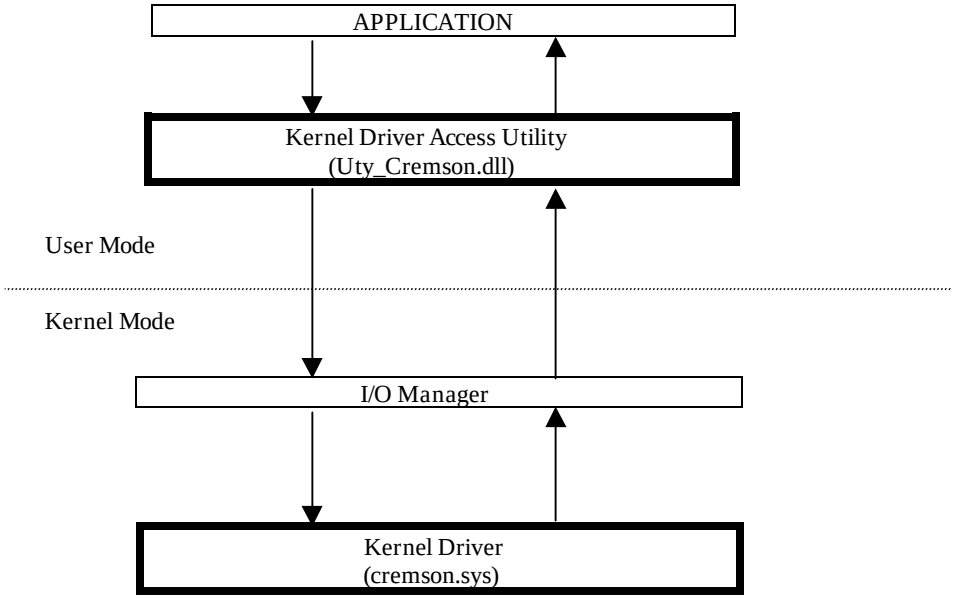
Outline

1. Functional Overview

This utility is a tool to access to Cremson resources, such as frame memory, host interface registers, display control registers, internal texture memory and drawing control registers, from Windows NT application programs.

2. Configuration



3. Operation Procedure

1. Installation of kernel driver

(1) Install the kernel driver (cremson.sys) at first. This installation is done by executing the following command in MS-DOS prompt mode of Windows NT:

C: ¥>regini.exe cremson.ini

(2) Copy the cremson.sys file to the following Windows NT system directory:

C:¥winnt¥system32¥drivers

*Note) If Windows NT Operating System is installed in the other directory than above, the cremson.sys must be copied to that directory in which Windows NT Operating System is installed.

(3) Reboot the PC

(4) Execute My Computer -> Control Pannel -> Devices
Select CREMSON in the list and click START.

After executing the above process, the kernel driver is activated.

2. Programming of application software

(1) For application software program to adopt Cremson, the following utility commands are used to access to such Cremson hardware resources, as frame memory, host interface registers, display control registers, internal texture memory and drawing control registers:

Uty_Cremson.dll
Uty_Cremson.lib

(2) Every application program must call initialization routine (Open_Cremson) first, and at the completion of it's operation a close operation routine (Close_Cremson) must be called. If this closing process is not executed, this utility can never be used after it.

(3) When READ/WRITE to physical Cremson resources is executed, each appropriate command to access to it's respective Cremson resource is used. Detail of these commands are described in chapter 5 Utility command interface specifications. These Cremson physical resources can be accessed by getting these physical addresses directly,. But in such cases, the result of an access, in which the address border of that physical resource is exceeded, will not be guaranteed. Therefore, the use of READ/WRITE command is strongly recommended.

(4) If application program is attempted to execute without starting the kernel driver, an error occurs.

3. Program samples

A program sample to read data from MMR register (address offset 0xFFFCh) of the host interface is shown as follows:

```
#define     TRUEEND     1
#define     ERROREND    0
#define     NOTOPENED   3
#define     READ_LONG   4
main ()
{
        ULONG     ret;
        ULONG     mmrdata;

        ret=Open_Cremson ();
        if (ret!=TRUEEND)
                return;
        else
        {
                ret=Read_Host (0xFFFC, (PUCHAR) &mmrdata,
                                sizeof (mmrdata), READ_LONG);
                if (Ret==TRUEEND)
                        //Normal end
                else
                        //Error

                Close_Cremson ();
}
```

4. Utility command overview

#	Utility command name	Description
1	Open_Cremson	Open Cremson PCI driver
2	Close_Cremson	Close Cremson PCI driver
3	Get_FrameAddress	Get the top address of the frame memory
4	Get_HostAddress	Get the top address of the host interface registers
5	Get_DisplayAddress	Get the top address of the display control registers
6	Get_TextureAddress	Get the top address of the internal texture memory
7	Get_DrawingAddress	Get the top address of drawing control registers
8	Read_Frame	Read data from frame memory
9	Read_Host	Read data from host interface registers
10	Read_Display	Read data from display control registers
11	Read_Texture	Read data from internal texture memory
12	Read_Drawing	Read data from drawing control registers
13	Write_Frame	Write data to frame memory
14	Write_Host	Write data to host interface registers
15	Write_Display	Write data to display control registers
16	Write_Texture	Write data to internal texture memory
17	Write_Drawing	Write data to drawing control registers
18	Write_Frame_Buffer	Write data to frame memory at buffer unit
19	Write_Host_Buffer	Write data to host interface registers at buffer unit

20	Write_Display_Buffer	Write data to display control registers at buffer unit
21	Write_Texture_Buffer	Write data to internal texture memory at buffer unit
22	Write_Drawing_Buffer	Write data to drawing control registers at buffer unit

5. Utility command interface specifications

(1) Open_Cremson

a. Format ULONG Open_Cremson (void)

b. Parameter None

c. Return value Normal end : 1

Abnormal end : 0

d. Function Open the Cremson PCI driver. Unless this command is successfully executed, no other command is applicable

(2) Close_Cremson

a. Format ULONG Close_Cremson (void)

b. Parameter None

c. Return value Normal end : 1

Abnormal end : 0

Unopened : 3

d. Function Close the Cremson PCI driver. If an application program is completed unles calling this command, no more utility command could be used..

(3) Get_FrameAddress

a. Format ULONG GetFrameAddress (void)

b. Parameter None

c. Return value Normal end : Top address of the frame buffer

Unopened : 3

d. Function Get the top address of the frame memory of Cremson

(4) Get_HostAddress

a. Format ULONG GetHostAddress (void)

b. Parameter None

c. Return value Normal end : Top address of the host interface registers

Unopened : 3

d. Function Get the top address of the host interface registers of Cremson

(5) Get_DisplayAddress

a. Format ULONG GetDisplayAddress (void)

b. Parameter None

c. Return value Normal end : Top address of the display control registers

Unopened : 3

d. Function Get the top address of the display control registers of Cremson

(6) Get_TextureAddress

a. Format ULONG GetTextureAddress (void)

b. Parameter None

c. Return value Normal end : Top address of internal texture buffer memory

Unopened : 3

d. Function Get the top address of the internal texture buffer memory of Cremson

(7) Get_DrawingAddress

a. Format ULONG GetDrawingAddress (void)

b. Parameter None

c. Return value Normal end : Top address of the drawing control registers
Unopened : 3

d. Function Get the top address of the drawing control registers of Cremson

(8) Read_Frame

a. Format ULONG Read_Frame (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the target frame memory area
PUTCHAR : Destination address to store the read data
ULONG : Size of data to read
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function Read data from frame memory of Cremson

(9) Read_Host

a. Format ULONG Read_Host (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the target host interface registers
PUTCHAR : Destination address to store the read data
ULONG : Size of data to read
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function Read data from host interface registers of Cremson

(10) Read_Display

a. Format ULONG Read_Display (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the target display control registers
PUTCHAR : Destination address to store the read data
ULONG : Size of data to read
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function Read data from display control registers of Cremson

(11) Read_Texture

a. Format ULONG Read_Texture (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the target internal texture memory
PUTCHAR : Destination address to store the read data
ULONG : Size of data to read
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function Read data from internal texture memory of Cremson

(12) Read_Drawing

a. Format ULONG Read_Drawing (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the target drawing control registers
PUTCHAR : Destination address to store the read data
ULONG : Size of data to read
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function Read data from drawing control registers of Cremson

(13) Write_Frame

a. Format ULONG Write_Frame (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the destination frame memory area
PUTCHAR : Source address to get the read data
ULONG : Size of data to write
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function Write data to frame memory of Cremson

(14) Write_Host

a. Format ULONG Write_Host (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the destination host interface registers
PUTCHAR : Source address to get the read data
ULONG : Size of data to write
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function Write data to host interface registers of Cremson

(15) Write_Display

a. Format ULONG Write_Display (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the destination display control registers
PUTCHAR : Source address to get the read data
ULONG : Size of data to write
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function Write data to display control registers of Cremson

(16) Write_Texture

a. Format ULONG Write_Texture (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the destination internal texture memory
PUTCHAR : Source address to get the read data
ULONG : Size of data to write

ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value
Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function
Write data to internal texture memory of Cremson

(17) Write_Drawing

a. Format
ULONG Write_Drawing (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter
ULONG : Offset of the destination drawing control registers
PUTCHAR : Source address to get the read data
ULONG : Size of data to write
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value
Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function
Write data to drawing control registers of Cremson

(18) Write_Frame_Buffer

a. Format
ULONG Write_Frame_Buffer (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter
ULONG : Offset of the destination frame memory area
PUTCHAR : Source address to get the read data
ULONG : Size of data to write
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value
Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function
Write data to frame memory of Cremson at buffer unit

(19) Write_Host_Buffer

a. Format
ULONG Write_Host_Buffer (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter
ULONG : Offset of the destination host interface registers
PUTCHAR : Source address to get the read data
ULONG : Size of data to write
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value
Normal end : 1
Abnormal end : 0
Length over : 2
Unopened : 3

d. Function
Write data to host interface registers of Cremson at buffer unit

(20) Write_Display_Buffer

a. Format
ULONG Write_Display_Buffer (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter
ULONG : Offset of the destination display control registers
PUTCHAR : Source address to get the read data
ULONG : Size of data to write
ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value
Normal end : 1
Abnormal end : 0
Length over : 2

Unopened : 3

d. Function Write data to display control registers of Cremson at buffer unit

(21) Write_Texture_Buffer

a. Format ULONG Write_Texture_Buffer (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the destination internal texture memory

PUTCHAR : Source address to get the read data

ULONG : Size of data to write

ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1

Abnormal end : 0

Length over : 2

Unopened : 3

d. Function Write data to internal texture memory of Cremson at buffer unit

(22) Write_Drawing_Buffer

a. Format ULONG Write_Drawing_Buffer (ULONG, PUCHAR, ULONG, ULONG)

b. Parameter ULONG : Offset of the destination drawing control registers

PUTCHAR : Source address to get the read data

ULONG : Size of data to write

ULONG : Data type (1: Byte, 2: Word, 4: Long word)

c. Return value Normal end : 1

Abnormal end : 0

Length over : 2

Unopened : 3

d. Function Write data to drawing control registers of Cremson at buffer unit